A STUDY ON PLACENTA PREVIA
- RISK FACTORS, MATERNAL AND FETAL OUTCOME

Dissertation Submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

in partial fulfilment of the regulations

for the award of the degree of

M.D. BRANCH – I I
OBSTETRICS AND GYNAECOLOGY

GOVT. R.S.R.M. LYING-IN HOSPITAL AND
GOVT. STANLEY MEDICAL COLLEGE & HOSPITAL
THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
CHENNAI, INDIA.

MARCH 2008

CERTIFICATE

This is to certify that the dissertation entitled "**A STUDY ON PLACENTA PREVIA - RISK FACTORS, MATERNAL AND FETAL OUTCOME"** is the bonafide original work of **Dr. S.M. PRIYADHARSHINI** in partial fulfilment of the requirements for **M.D. Branch – II (Obstetrics and Gynaecology)** Examination of the Tamilnadu Dr. M.G.R. Medical University to be held in March 2008. The period of study was from June 2006 to July 2007.

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DECLARATION

I, **Dr. S.M. PRIYADHARSHINI,** solemnly declare that dissertation titled, "**A STUDY ON PLACENTA PREVIA - RISK FACTORS, MATERNAL AND FETAL OUTCOME"** is a bonafide work done by me at Govt. R.S.R.M Lying in Hospital, Chennai during 2005-2008 under the guidance and supervision of my Unit Chief **Prof. P. SASIREKA, M.D. , D.G.O.**

The dissertation is submitted to Tamilnadu, Dr. M.G.R. Medical University, towards partial fulfilment of requirement for the award of **M.D. Degree (Branch – II) in Obstetrics and Gynecology.**

Place : Chennai.

Date :

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ACKNOWLEDGEMENT

I gratefully acknowledge and sincerely thank Professor **Dr. MYTHILI BHASKARAN, M.D.(Phy), D.G.O.,** Dean, Stanley Medical College, Chennai for granting me permission to utilize the facilities of the institution for my study.

I am grateful to **Dr. AMRITA PRESCILLA NALINI, M.D., D.G.O.,** Superintendent i/c, Govt. R.S.R.M. Lying-in Hospital, Royapuram, Chennai for her guidance.

I am grateful to **Dr. SASIREKA, M.D., D.G.O.,** Govt. R.S.R.M. Lying-in Hospital for her guidance, support and encouragement for conducting this study.

I thank **Dr. RUPA, M.D.,D.G.O., Dr. ANURADHA, M.D., D.G.O.** and **Dr. FAMIDHA, M.D., D.G.O.** for their valuable opinions and guidance.

I also thank all assistant professors for their help and guidance.

Finally my heartfelt thanks goes to the patients without whom this work would not have been possible.

CONTENTS

INTRODUCTION

Placenta forms the most important link between the developing fetus and the mother. Normal situation of placenta is very vital for appropriate growth and development of fetus. Once there is a change in placental location or architecture outcome of pregnancy with regards to both the mother and the fetus is altered. Kurt Benirschke (1981) observed “Placenta is the most accurate record of the infant prenatal experiences.

The placenta in majority of cases is situated in the upper uterine segment usually near the fundus on the posterior wall of the uterus and less frequently on the anterior wall. But unfortunately due to one or other causes placental position may alter, lying wholly or partially in the lower uterine segment resulting in placenta previa.

Regardless of etiology maternal and fetal risks are increased by several folds in case of placenta previa; in mother, the risks are mainly due to life threatening antepartum hemorrhage,and also there’s increased incidence of puerperal sepsis and postpartum haemorrhage. This is because the lower segment to which the placenta is attached contracts less well post-delivery.Chances of abnormal adherence of placenta is also increased several

fold . With regard to baby, incidence of LBW, IUGR, preterm deliveries and congenital malformations are increased.

Literature reveals that antepartum hemorrhage complicates 2-5 % of pregnancies of which approximately one third are due to placenta previa.

Although the causes of placenta previa are poorly understood a number of studies have established its association with such factors as advancing maternal age, multiparity, previous cesarean section ,previous spontaneous or induced abortion ,and multiple gestation.

The current study is done to asses the relationship between placenta previa and the above reported risk factors through case control study.In addition the present study is an endeavour to have an insight in to the clinical implications of placenta previa.

AIM AND OBJECTIVES

1) To study the incidence of placenta previa in general obstetric population .

2) To study the high risk factors predisposing to placenta previa

3) To study the maternal and fetal outcome in cases of placenta previa.

4) To find out the diagnostic accuracy of ultrasonogram in cases of placenta previa and to compare between the efficacy of transvaginal and transabdominal ultrasound in the diagnosis of placenta previa.

REVIEW OF LITERATURE

PLACENTA PREVIA

Definition :

It is a condition characterised by the implantation of the placenta in the lower uterine segment. It may be over or near the internal os of the cervix

Classification :

F.J.Browne classified placenta previa in to 4 degrees.

1) Placenta dips in to the lower uterine segment by its lower margin. The greater part of it being in the upper uterine segment.
2) Edge of the placenta reaches the internal os.
3) Placenta overlaps the internal os when closed but does not cover it entirely when fully dilated.
4) Placenta is low in attachment that its centre roughly corresponds to the centre of the internal os when fully dilated.

Recent Classification : Williams 2001

1. Total placenta previa

   The internal cervical os is covered completely by placenta.

2. Partial placenta previa

   The internal cervical os is covered partially by placenta

3. Marginal placenta previa

The edge of the placenta is at the margin of the internal cervical os.

4. Low Lying placenta

The placenta is implanted in the lower uterine segment such that the placental edge actually does not reach the internal os but in close proximity to it.

Incidence :

The incidence of placenta previa varies greatly from one series to another ranging from 1 in 167 to 1 in 327 pregnancies. Moreover approximately it occurs 1 in 200 pregnancies ,with the incidence ranging from 0.29% - 1.24% in different studies (Fraser and Watson 1989)

The incidence of different types is approximately, the following

Total placenta previa 23% to 31.3%

Partial placenta previa 20.6% to 33%

Low lying placenta 37% to 54.9%

Etiological and Associated factors

No single, specific etiology can be found for most cases of placental implantation. The etiology of placenta previa is multifactorial. Amidst them underperfusion and undervascularisation caused by atrophy or inflammation are often quoted as etiological factors for low implantation.The other probable risk factors are as follows :

1. Maternal age

The risk of placenta previa increased dramatically with advancing maternal age. (Zhang et al., 1993).The risk is 2-3 times higher in women over 35 years than women less than 20 years.Women older than 40 years have a ninefold greater risk than women under the age of 20 years.(Ananth CV 1996)[12]

2. Gravidity

Placenta previa is higher among gravida more than 4.(Abu-Heija et al.,1999)[14].

3. Parity

Placenta previa occurs in 0.2% of nulliparas and up to 5% 0f grand multiparas. Multiparity is associated with increased risk of placenta previa **(** CV Ananth, AJ Wilcox, DA Savitz, Bowes WA Jr, and ER Luther 52 **)**[13]

4. Ethnic origin and socioeconomic status

Slightly higher incidence is reported in Blacks.Asian women residing in the United states are at increased risk of placenta previa.(Taylor 1995)[16]. Studies show no independent relationship emerged with socioeconomic factors.

5. Multiple gestation

Strong and Brar 1989 showed that the incidence of placenta previa is 0.55% for twins compared with 0.31% in singleton gestations. On the contrary Francois et al., 2003[18], reported that the occurrence and complications of placenta previa did not differ betweem singleton and multiple gestations.

6. Endometrial damage

A six fold increase in the risk of placenta previa following therapeutic termination of pregnancy in the first trimester has been reported. The risk of placenta previa may be increased in a dose dependent manner by multiple sharp curettage abortions,However vacuum aspiration does not confer an increased risk.(Johnson LG 2003)[19]

7. Previous cesarean Section

Various studies state that the incidence increases with the number of previous caesarian deliveries.It was 1.9% with two prior cesarean sections and 4.1% with 3 or more. The risk is highest in the pregnancy immediately following the cesarean section. Placenta previa shows preference to the anterior uterine wall in 67% of scarred uterus.The relative risk for placenta accreta in patients with placenta previa was 35 times higher in those with a previous cesarean section than in those with an unscarred uterus.

8. Uterine scars and pathology

Uterine scars from surgical procedures as myomectomy and hysterotomy, endometritis, submucous fibroids, adenomyosis and uterine adhesions may all be predisposing factors to placenta previa.

9. Smoking abuse

In Western countries cigarette smoking and cocaine abuse contribute to the increasing incidence of placenta previa.Handler (1994)[20] reports that pregnant women who smoke more than 20 cigarettes per day are over two times more likely to experience placenta previa and pregnant women who use cocaine are 1.4 times more likely to experience placenta previa than non users.

Other associations include anemia.closely spaced pregnancies and tumours distorting the uterine contour.

First trimester threatened abortion is associated with about $2^{1}/_{2}$ fold risk of placenta previa than in the general obstetric population have been reported in many studies.

10. Associated pregnancy complications

1. Spontaneous abortions
2. The frequency of pregnancy induced hypertension is decreased among the pregnancies with placenta previa.(Liberman JR 1991)[21]
3. Congenital malformations have been reported to occur twice commonly in fetus of mothers with placenta previa(Brenner et al., 1978)[22]
4. Abnormal fetal presentations such as breech shoulder and compound presentation are seen in about 30-35 percent of cases.

5. Placenta membranecea, marginal or velamentous cord insertion, succenturiate lobes, bipartite placenta, fenestrated placenta, placenta accreta and percreta are all more commonly found in placenta previa.
6. Placenta previa may be associated with placenta accreta increta or percreta.Placenta accreta occurs in about 5% of women with an unscarred uterus and placenta previa, 24% of women with one previous cesarean section.(Clark and colleagues 85)[24]

   The recurrence rate following a prior placenta previa is 4-8%. 10%of women with placenta previa have a coexisting abruption.(Hibbard 1988)[25].

CLINICAL PRESENTATION

The most characteristic event in placenta previa is “painless uterine bleeding”. The classical feature is sudden onset of painless, apparently causeless and recurrent bleeding. Fortunately the initial bleeding is rarely so profuse to prove fatal. It has a peak incidence around the 34^{th} week. Frequently bleeding has its onset without warning, when the women is at rest in bed, although it may follow straining efforts or after coitus.

Preterm delivery is increased in women with placenta previa with bleeding. Fetal distress is unusual unless the bleeding is severe enough to cause maternal hypovolemia. Disseminated intravascular coagulation rarely occurs in association with placenta previa.

DIAGNOSIS

1. History
2. Clinical examination
3. Ultrasound
    a. Transabdominal
    b. Transvaginal
    c. Transperineal
4. Magnetic resonance imaging
5. Radiography
    a.Cystography-of historic interest
    b.soft tissue radiography

c.Detection of fetal head displacement

d.Detection of placental calcification

e.Radio isotope localization of placenta with $I^{131.}$,I^{132}TC^{,,99,}Cr^{51}

6. Infrared thermography

Clinical Examination

a. General condition

General condition and anaemia are proportionate to the visible blood loss. But in the developing countries, the picture is often confusing due to pre existing anemia.

b. Abdominal Examination

The size of the uterus is proportional to the period of gestation. The uterus feels relaxed; fetal parts are felt easily, and there is no tenderness. The presenting part will be found higher in major degrees. Fetal heart sounds are present or absent depending on the degree of bleeding.

Slowing of fetal heart rate on pressing the head down in to the pelvis and returns to normal promptly when the pressure is released is suggestive of low lying placenta specially of posterior type.(Stallworthy's sign)

e.Vulval inspection

1. to note whether the bleeding is still active or ceased.
2. character of the blood – bright red or dark coloured and the amount of blood loss is to be assessed

d.Speculum examination

Per speculum examination may be deferred until evidence that placenta previa does not exist is obtained, as extra uterine causes of antepartum hemorrhage are usually benign and thus need not be diagnosed urgently.

e.Vaginal Examination

Vaginal examination should never be done just for the purpose of diagnosis as it is likely to produce severe bleeding.

f. Double Set Up Examination

Examination of the cervix is never permissible unless the women is in a operative room with all the preparation for immediate cesarean delivery. With the advent of endovaginal ultrasound double set up examination belongs to the history of medicine.

ULTRASOUND

With the advent of recent technological advances in ultrasonography, with its reliability and interpretation,radiographic and isotonic techniques have become outdated.

1. Transabdominal ultrasound (TAS)

It is the simplest ,most precise and safest method for placental localization. The average accuracy presented is about 96% with its false positive and false negative rate up to 6% and 8% respectively (Laing,1996)

Factors which decrease the visibility in TAS include the following :

- Maternal obesity
- Attenuation of the ultrasound beam by the fetal presenting part
- Myometrial contraction, placental thickness, cervical effacement and extra amniotic blood clots from partial separation of placenta previa may also lead to a false impression of the position of the placental lower edge.
- Distended urinary bladder
- Therefore all the studies should be done with full bladder first,followed by stepwise emptying prior to reporting.

2. Transvaginal ultrasound.(TVS)

It is the diagnostic technique of choice for placenta previa. It is more accurate than TAS in locating the placenta especially for the posteriorly situated placenta with 93% positive predictive value and 98% negative predictive value. The advocates of TVS recommend that the probe while examining should be inserted no more than 3cm in to the vagina and the angle between the axis of the cervix and that of the vaginal probe should be atleast 44 degree with an angle which is sufficient to prevent the probe from inadvently slipping in to the cervix. With this careful technique no one has experienced any hemorrhagic complications. (Cunnigham 1989)

Transperineal ultrasound

90%positive predictive value and 100%negative predictive value were reported by Hertzberg (1992)

Transvaginal colour Doppler

1. TVS and colour Doppler imaging improve the diagnostic accuracy of placenta accreta in patients with persistent placenta previa. It is also used to diagnose vasa previa.

Magnetic Resonance Imaging

MRI is the most precise method of diagnosing placenta previa and its complications. But at present due to high cost it is available in limited centres and generally used for selected cases. The duration of examination with MRI for a placenta previa is approximately 20 minutes.

Advantages

1) Can be done without full bladder
2) Removes operator error
3) Useful in posterior placenta
4) To diagnose placenta accreta and percreta

Transmigration

The term migration is clearly a misnomer. The incidence of placenta previa early in pregnancy ranged between 5 to 15%. But the incidence at term is 0.5%. this has been explained by the differential growth of lower uterine segment.

Management

Management strategies are based on the following :

- ❖ the maternal condition and amount of bleeding
- ❖ fetal condition (gestational age and expected birth weight)
- ❖ neonatal facilities

1. Antenatal management

Inpatient management is still appropriate for women with major placenta previa in the third trimester. Prior to delivery all women with placenta previa and their husbands should be discussed with regarding delivery and blood transfusion requirements. Studies show that patients undergoing cerclage have reached more advanced gestational ages and larger birthweights than patients treated with expectant management alone. On the contrary the RCOG

guidelines differs from above pointing out the use of encirclage is not backed up by sufficient evidence.

Tocolysis for the treatment of uterine activity in the presence of bleeding may be useful. Magnesium sulphate has become the drug of choice for the treatment of patients with placenta previa. If ritodrine or terbutaline is used ,the maternal vital signs should be in the normal range and there should be no bleeding.

2. Management of patients with severe bleeding

Patients with placenta previa should be managed in a tertiary centre with neonatal facilities. The efficient management plan includes

1) Life support measures
2) Immediate operative interventions

1.1. Life support measures

- if the patient is in shock two intravenous lines with a 16 gauge canula should be established.
- 20ml of blood should be collected for evaluating complete blood count
- 4units of blood should be crossmatched
- Fluid replacement and blood transfusion
- Intensive observation and monitoring
- Assessment of renal function and establishment of central venous pressure line

There is no evidence to support the use of autologous blood transfusions..(Dinsmoor MJ,1995)[45]

2. Fetal evaluation

No time is usually available for an indepth fetal evaluation, while establishing the life support measures. However fetal heart rate monitoring and ultrasound examination should be performed to determine fetal number, position, estimated fetal weight and placental localization.

DELIVERY

Patients with placenta previa with severe bleeding should be delivered irrespective of the type of placenta previa. Any woman going to the theatre with known placenta previa should be delivered by the most experienced obstetrician available.

ANAESTHESIA

The anaesthesia of choice for patients who is bleeding or who may bleed is general anaesthesia with endotracheal intubation. However recent evidence from USA suggests that regional anaesthesia could be safe. Frederiksen MC et al.,(1999)[46] and Praekh N (2000 et al)[47], also observed the same in their studies.

Type of incision

In most cases a transverse uterine incision is made. Due to the occasional risk of fetal bleeding resulting from incision in to an anterior placenta, a vertical incision is sometimes recommended in these circumstances.

When difficulties are encountered in transverse lower segment incisions these may be converted to inverted T,J or U shaped incisions

The operator can reach the fetus by cutting through the placenta or by reaching around the placenta caudally or laterally. The former approach may be quicker but to be discouraged generally as it can result in severe fetal hemorrhage.

Postpartum Hemorrhage

Because of the poorly contractile nature of the lower uterine segment there may be uncontrollable hemorrhage following placenta removal.

The various methods to control blood loss discussed by the experts are as follows

1. Uterotonic agents-systemic or local
2. Bimanual compression
3. Uterine packing
4. Aortic compression(DHSS 1986)
5. Over sewing the implantation site
6. Figure of 8 sutures
7. Circular interrupted sutures around the lower segment above and below the transverse incisions (Cho and colleagues 1991)
8. B Lynch sutures (brace suture)
9. Modified B Lynch suture
10. Isthmic cervical opposition sutures

11. Uterine artery ligation
12. Lower uterine vessel ligation
13. Step wise devascularisation
14. Arterial embolisation
15. Argon beam coagulator

Surgical management-Cesarean hysterectomy

Fetal risks

Different authors present the following fetal risks in the series

1) Premature delivery
2) Low birthweight
3) Suboptimal fetal growth
4) Sudden intrauterine death
5) The risk of neonatal mortality was higher for babies born to women with placenta previa than for babies born to women without placenta previa when they are delivered at or more than 37 weeks of gestation
6) Anaemia
7) Respiratory Distress syndrome/Birth asphyxia
8) Perinatal mortality has been declined from 60% in 1990 to 2.3% in 1999.
9) High risk for sudden infant death syndrome(SIDS)

10) Long term follow up shows normal growth and psychomotor development but a small increase in the incidence of neurological abnormalities

Maternal Risks

1. Antepartum, intrapartum and postpartum hemorrhage
2. Anaesthetic and surgical risks
3. Blood transfusion hazards
4. Air embolism
5. Postpartum sepsis with ascending infection through raw placental bed.

MATERIALS AND METHODS

All the cases of placenta previa admitted and delivered at the Government RSRM Lying In Hospital, Chennai-13 during the period of June 2006 to July 2007 were studied in detail.500 women who delivered during the same period were taken as control to study on risk factors.

Age of the patient, Booking status, details of obstetric history, including previous pregnancy outcome, number of previous normal deliveries, number of previous LSCS, its indications,elective /emergency sections, postoperative events, interval between two pregnancies, number of previous abortions, spontaneous or induced, certified/uncertified are collected. Gestational age at the onset of bleeding, expectant management, gestational age at delivery and the mode of delivery were studied. The birth weight and APGAR score of the newborn were also taken.

A detailed study of USG findings by both transabdominal and transvaginal route were done in cases of clinically suspected /ultrasonically diagnosed cases of placenta previa. A clinical confirmation of localization of placenta following delivery in case of vaginal delivery or operative findings when delivered by operative interventions were studied.

Lastly a correlation between ultrasonic diagnosis and operative findings were made so as to find out the diagnostic accuracy of USG in placental

localization.Also a comparison was made between transabdominal and transvaginal ultrasound in assessing the placental localization.

RESULTS

A prospective study of all the placenta previa cases delivered at the Govt. RSRM Lying-in Hospital, Chennai from June 2006 to July 2007 was done. A control of 500 patients without placenta previa were selected randomnly during the same period.

Total number of deliveries during this period were 14246, of these 14369 were live births, total number of twin deliveries were 182. Total number of placenta previa were 114.

Incidence of placenta previa

The incidence of placenta previa among total deliveries during this period in our hospital was 0.8%.The incidence of placenta previa in total live births during the study period was 7.9/1000 live births.

Among the 14246 deliveries, 14064 were single term and 182 were multiple gestations. The overall occurrence of placenta previa diagnosed at delivery was 114 out of 14246 (0.8%). Of these 112 were singleton and 2 were multiple gestations. The incidence of placenta previa in single gestation is 0.79%. The incidence of placenta previa in multiple gestation in 1.09%.

TABLE 1

DISTRIBUTION OF CASES ACCORDING TO THE AGE

Age distribution	No. of Case	Percentage
< 20	4	3.5
20 – 24	61	53.5
25-29	35	30.7
30-34	10	8.7
> 35	4	3.5
Total	114	100

Maximum number of placenta previa cases were in the age group of 20 – 24 which is the period corresponding to the maximum fertility and also represents the greatest proportion of population in our study.

TABLE 2

TEST OF ASSOCIATION BETWEEN AGE AND GROUPS

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Age Distribution	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
< 20	4	3.5	50	9.9		
20 – 24	61	53.5	289	57.8		
25-29	35	30.7	123	24.6	9.89	0.0422
30-34	10	8.7	32	6.7		
> 35	4	3.5	6	1.3		
Total	114	100	500	100		

Age is compared between the case and control and the difference was found statistically significant at $p < 0.05$ ($\chi^2 = 9.89$ $p= 0.0422$). The percentage of placenta previa was more than control among the higher age groups $\geq$ 25 years. The mean age of cases was 25.2 years and control was 23.7 years.

TABLE 3

STUDY OF OCCURENCE IN ELDERLY GRAVIDA

Age	Case	Control	χ^2 Tests
> 35	4	6	3.1 P = 0.007
< 35	110	494	
Total	114	500	

OR = 299

The risk of placenta previa is 2.99 times higher in age $\geq$ 35 years than those less than 35 years but it is statistically less significant.

In comparison with groups <20 years old, advancing maternal age was associated with progressively increased risk of placenta previa.

TABLE 4

TEST OF ASSOCIATION BETWEEN GRAVIDITY AND GROUPS

Gravidity	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
1	24	21.05	231	46.3	29.18	P<0.012
2	49	42.98	178	35.6		
3	33	28.95	72	14.3		
$\geq$ 4	8	7.02	19	3.8		
Total	114	100	500	100		

TABLE 5

COMPARISON BETWEEN PRIMI AND MULTIGRAVIDA

Gravidity	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Multi Gravida	90	78.94	269	53.8	24.18	P< 0.0001
Primi gravida	24	21.06	231	46.2		
Total	114	100	500	100		

OR = 1.8

The risk of placenta previa is 1.8 times higher in multi gravida than in primi gravida (χ^2 = 24.18, p < 0.0001) and it is statistically significant. With increasing gravidity the risk of placenta previa is also increased dramatically

.

TABLE 6

TEST OF ASSOCIATION BETWEEN PARITY AND GROUPS.

Parity	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
0	42	37.1	243	49	7.2	0.08
1	53	46.1	182	36.5		
2	18	15.9	60	12		
3	1	0.9	12	2.4		
$\geq$ 4	0	0	3	0.6		
Total	114	100	500	100		

TABLE 7

COMPARISON BETWEEN PRIMI AND MULTI PARA

Parity	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Multi para	72	63.15	257	21.4	6.442	0.027
Nullipara	42	36.85	243	48.6		

OR = 1.55

The risk of occurrence of placenta previa is 1.44 times higher in multipara than in nullipara with statistical significance of p = 0.027.

TABLE 8

TEST OF ASSOCIATION BETWEEN ABORTION AND GROUPS.

Abortion	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Yes	30	26.31	61	6.1	41.98	P<0.0001
No	84	73.69	439	93.9		
Total	114	100	500	100		

OR = 4.2

This table shows that those with previous abortions had a 4.2 times higher risk of placenta previa in subsequent pregnancy than in those without abortion. It is remarkably significant (p<0.0001)

TABLE 9
PLACENTA PREVIA AND PREVIOUS LSCS

Previous LSCS	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Yes	51	44.7	75	15	50.33	P<0.0001
No	63	55.3	425	85		
Total	114	100	500	100		

OR = 3.1

Previous cesarean section has a 3.1 times higher risk of placenta previa in subsequent pregnancy than those without it (p<0.0001).

TABLE 10

PLACENTA PREVIA AND MALPRESENTATIONS

Breech	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Yes	12	10.5	12	2.7	9.46	P=0.042
No	102	89.5	488	97.6		
Total	114	100	500	100		

OR = 3.2

The risk of breech presentation is 3.2 times higher in placenta previa than the control group and it is statistically significant.

TABLE 11

PLACENTA PREVIA AND MALE BABY ASSOCIATION

Sex	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Male	70	59.1	260	52	3.30	P=0.06
Female	44	40.9	240	48		
Total	114	100	500	100		

OR = 1.46

Male : Female ratio in case = 1.59.

Male : Female ratio in control = 1.08

There is only slightly increased risk of male baby percentage in placenta previa cases when compared to controls.

TABLE 12

PLACENTA PREVIA AND MULTIPLE GESTATIONS

	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Multiple Gestation	2	1.75	7	1.3	0.08	P=0.77 (NS)
Singeton	112	98.25	493	98.6		
Total	114	100	500	100		

OR = 1.2

No significant association was found statistically between multiple gestation and placenta previa. But the risk of development of placenta previa is 1.2 times more in multiple gestation.

TABLE 13

COMPARISON OF MULTIPLE GESTATION IN PLACENTA PREVIA AND GENERAL POPULATION

	Placenta Previa		Total Deliveries		χ^2 Test	P value
	No.	%	No.	%		
Multiple gestation	2	1.75	182	1.27	2.214	P = 0.22 (NS)
Singleton	112	98.25	14064	98.73		
Total	114	100	14246	100		

When comparing multiple gestation among total deliveries versus placenta previa no statistical significant association was found.

TABLE 14
PLACENTA PREVIA AND ANOMALIES

Anomalies	Case		Control		χ^2 Test	P value
	No.	%	No.	%		
Yes	4	3.5	3	0.6	6.8	P = 0.04
No	110	96.5	497	99.4		
Total	114	100	500	100		

OR = 4.2

The risk of getting anomalies is 4.2 times higher among the placenta previa cases than the control.

TABLE 15

BOOKING STATUS OF PLACENTA PREVIA CASES

Placenta Previa	No. of Cases	Percentage
Booked	110	96.2
Unbooked	4	3.8
Total	114	100

It is observed from the table that maximum number of patients had regular antenatal checkup except a very few patients. (3.8%)

TABLE 16
INTERPREGNANCY INTERVAL

Years	No. of Cases	Percentage
<2	39	52
2-4	29	38.6
>4	7	9.4
Total	75	100

Mean interpregnancy interval is 2.2 years.

TABLE 17

ANALYSIS OF PRESENTING SYMPTOMS

Symptoms	Number	Percentage
Vaginal Bleeding	86	76.65
Abdominal pain	20	8.7
Draining P/V	9	4.2
↓ Fetal Movements	5	4.3
Safe Confinement	4	3.15
Total	114	100

On admission 76% of patients had bleeding per vaginum as their main complaint. Only 3.1% of cases were admitted with no complaint and for safe confinement.

TABLE 18

GESTATIONAL AGE AT THE ONSET OF BLEEDING

Weeks	No. of Cases	Percentage
28	6	5.26
30	4	3.5
32	16	14
34	32	28.1
36	28	24.6
38	16	14.0
40	12	10.5
Total	114	100

Mean gestational age at bleeding in 34.95 weeks. The initial episode of bleeding has a peak incidence around 34 weeks of gestation.

TABLE 19

DAYS ON EXPECTANT MANAGEMENT

Days	No	Percentage
<7	15	34
7-13	17	38.6
14-20	7	15.9
> 21	5	11.63
Total	44	100

Among the 114 cases 44 cases were kept on expectant line of management. Of these 15 (34%) delivered within 1 week and 29(66%) crossed more than 7 days. Out of 5 cases who were on expectant management more than 21 days, 2 patients crossed more than 50 days.

TABLE 20

GESTATIONAL AGE AT DELIVERY

Weeks	No. of Cases	Percentage
< 30	2	1.73
30-32	8	7.01
32-34	17	14.91
34-36	16	14.03
≥ 37	71	62.28
Total	114	100

The average gestational age at delivery is 36.6 weeks. Our study shows that 37% of cases delivered before 37 weeks of gestation.

TABLE 21

MODE OF DELIVERY

	No. of Cases	Percentage
Vaginal	11	9.66
LSCS	56	49.12
Repeat LSCS	43	37.71
Lower Segment Hysterotomy	2	1.76
Subtotal hysterectomy	2	1.76
Total	114	100

TABLE 22

INCIDENCE OF CESAREAN SECTION FOR PLACENTA PREVIA IN SCARRED AND UNSCARRED UTERI

	Placenta Previa	Cesarean Section	Labour Natural	percentage
Scarred	51	51	-	100
Unscarred	63	52	11	86.4

TABLE 23

MODE OF DELIVERY

Mode of Delivery	Minor Degree		Major Degree	
	No.	%	No.	%
Vaginal	8	14.8	3	5.06
Cesarean	46	85.2	57	94.94
Total	54	100	60	100

TABLE 24

TYPE OF ANAESTHESIA

Type	No. of Cases	Percentage
General	18	17.4
Spinal	85	82.5
Total	103	100

Those who delivered by cesarean section spinal anaesthesia was used in 82.5% and General anaesthesia in 17.4% of cases who had features of shock.

TABLE 25

INCIDENCE OF PRETERM BABIES

Maturation	No. of Cases	Percentage
Term	73	62.93
Preterm	43	37.07
Total	116	100

Incidence of preterm babies in placenta previa cases were around 37%.

TABLE 26

	No. of Cases	Percentage
Alive	112	98.2
Dead	4	1.9
Total	116	100

TABLE 27

DISTRIBUTION OF BIRTH WEIGHT AMONG THE CASES

Wt. in Kg.	No. of Cases	%
< 1.5	4	3.4
1.5-1.99	12	10.3
2-2.4	42	36.2
2.5-2.99	38	32.75
3-3.4	17	14.65
≥ 3.5	3	2.58
Total	116	100

Mean birth weight is 2.3 ± 0.5 kgs.

45% of babies are <2.4Kgs.

TABLE 28

APGAR SCORE IN NEW BORN

Score	Apgar	Percentage
<7	42	36.84
> 8	72	63.16
Total	114	100

TABLE 29

TYPES OF PLACENTA PREVIA

Type	No. of Cases	Percentage
I	36	31.57
II Anterior	18	15.79
II Posterior	10	8.78
III	26	22.8
IV	24	21.05
Total	114	100

Out of 114 cases 54 cases had minor degree of placenta previa and 60 cases major degree.

For all 128 cases of suspected placenta previa both transabdominal and transvaginal ultrasound were done. Transvaginal scan correctly identified 112 of 114 cases with the sensitivity of 98% and Transabdominal scan correctly identified 108 of 114 cases sensitivity of 94.3%.

TVS	PP	NP	Total
+	112	2	114
-	2	12	14
Total	114	14	128

Sensitivity 98.2%

TAS	PP	NP	Total
+	108	6	114
-	6	8	14
Total	114	14	128

Sensitivity 94.7%

Transvaginal ultrasound was superior to transabdominal ultrasound in diagnosing placenta previa.

DISCUSSION

The incidence of Placenta Previa among the total deliveries in Govt. R.S.R.M. Lying in hospital Chennai form June 2006 to July 2007 was 0.8%

Our hospital incidence correlates with the studies of Bhatt SSA Hospital, Bawada 1985(0.831) Maheshkumar, S.S.M. Collage Timkur (2002)- -0.8% TOWW(19945)-0.83% Cotton (1986)- 1.02% Frases (1989)-0.29 to 1.24%

Occurrence of Placentra previa in our Hospital is about 1 in 125 Livebirths Various Studies show the incidence as follows:-

Simpsion	1962-1974	1in 116
Ananth cv	1997	1in 200
Menon	1962	1in 187
Frederiksion	1999	1in 180
Crane	1999	1in 180
Present study	2006-2007	1 in 125

The incidence of placenta previa in total live birth during the study period was 7.9per 1000. Reports from other studies are shown below.

Zhang et al north carolina	1990	4.4/1000
Anantha CV	2003	2.8/1000

Our hospital incidence is higher than other studies. The incidence of Placenta previa in singleton gestation during the present study is 0.79%. Other authors quoted the following incidence.

Strong et al	1989	0.3%
Hendricks	1999	1%
Institute of Obstetrics & Gynaecology, Chennai	1999	0.7%
Sheiner	2001	0.38%

The incidence of the present study correlates with those mentioned above.

Our study showed that 98% of case were booked and this indicates the awareness of the public about the antenatal care and availability of antenatal care in this area.

Age

Abu Heija 1999 reports that the incidence of placenta previa cases increases with advancing maternal age. Zhang 1993 reports the risk of occurrence placenta previa is 2.3 times more in those older than 35years than 20years. Ananth CV 1999 states that the risk increases 9fold over 40 years. At parkland hospital from 1988-1999 the incidence is 1 in 1500 for women 19 or less, and for women over 35 it is 1in 100.

In our present case control study the percentage of case is more than the control among the higher age group $\geq$ 25years. The average age in our study was 25.2 $\pm$ 4.16 and correlates with the barnet *et al.*1981. The pattern found in our study is similar to Zhang *et al* 1993.

Gravidity

Abu 1993, observed that the risk increased in >4 gravida with the P<0.0020. In our study also, the percentage of cases increases with higher gravida when compared with the control group, with statistically significant p value of p <0.01. In our study 21% of cases are primi which is lower than the control (46.3%) and the risk is 2.2 times higher in multi than the primi gravida (p value 0.02). It was observed from our study, that with increasing gravidity the risk of placenta previa increases dramtically . Zhang 1993, also observed the same.

Parity

Studies show that the risk of placenta previa increases with increasing parity Abu Heija 1999 observed that the risk increases with parity more than 3. ($P<0.01$). Our present study also show that the risk of occurrence of placenta previa is higher in multipara than nullipara and it correlates with the above study.

Abortion.

Various authors point out that, the risk of Placenta preiva increases with previous abortions. Parazzini (1999)reports a relative risk of 1.8 and Ananth CV 1997 reports relative risk of 1.6 for spontaneous abortion and 1.7 for induced abortion. In this current study, those with previous abortion had 4times higher risk of placenta previa in subseqeuent pregnancy than those without p(0.0007). Similar result was mentioned by Zhang *et al.* 1993

Previous LSCS

The risk of placenta previa occurring in the pregnancy following a caesarean delivery is 1-4% (Gabee), Relative risk of 1.2 for 1 previous caesarean section and 2.1 for 2 previous caesarean section is showed by Parazzini 1994, Ananth 1994 mentioned that the relative risk is 3.8 in case control study and 2.4% in Cohort study. Taylor 1994 shows 1.48 as relative risk and to WW 1995, reveals, that 10.2% cases have history of previous

caesarean delivery and relative risk between scarred and unscarred uterus is 1.64. Abu Heija 1993 study showed a statistically significant p value of <0.02. Zhang *et al.* 1993 states, that those with previous uterine scar had a 1.8 times higher risk of placenta previa in subsequent pregnancy than those without. In our study, the incidence of placenta previa was 2.9%, about 6 times more than in unscarred uteri where the incidence was 0.5% p(<0.05) which is in accordance with the above studies.

Mal presentation

It is observed from different studies that malpresentation occurs in 30-34% of placenta previa cases. Cotton and Crenshwa quoted that malpresentations occur in 1/3 of cases. Stallworth 1951 reports 20% but in our study the incidence is 10.5% which is low when compared with others. Incidence. of malpresentation is about 4times higher than in the control population which was statistically significant (p<0.05).

Anomalies

Anomalies	Brenner 1978	6.0%
	Macafee 1945	8.4%

Present study shows the risk of congenital anomalies is 5 times higher among placenta previa cases than the other cases, which is similar to Brenners report.

Multiple gestation

Strong and bar[17] reported that an increased incidence of placenta previa in multiple gestation (0.55%) Parazzini 1994 reported that there is no link between multiple gestation and occurrence of placenta previa Francoises 2003[18] also reported that there was no difference in the occurrence of placenta previa between singleton and multiple gestation. The same results were observed in our study.

Presenting sypmptons

In our study, 77% of placenta previa patients had bleeding per vaginum .Among them 45% of patients had bleeding as first symptom . 8.7% of cases presented with abdominal pain. In Rosario's 1971 series of 142 cases painless bleeding occured in 90% of the patients. Love CD *et al* 1966, reports 72% had at least one episode of bleeding Fukuoka *et al* 2003 reports,79% patients

having bleeding PV and 71.4% of patients presenting with bleeding presenting with bleeding as first symptom. When comparing with the above studies the present study correlates with the study incidence.

Asymtamatic placenta previa	Macafee	162-15%
	Morgan	1965-19%
	Hill *et al*	1980-35%
	Current study	2006-2007 3.1%

The incidence of asymptomatic placenta previa is very much lower in our study compared to other studies

Gestational age at onset of bleeding

Menon 1963 observed that 72% of the cases bleed before 36weeks, Rao *et al* reported that 25% cases bleed before 32weeks. In the series of Hibbard 1988,bleeding occurred before 36weeks in 50% of placenta previa cases. Various studies show that the peak incidence is at 34 weeks and bleeding occurs before 30weeks in 1/3rd of cases and after 36weeks in another 1/3 of cases. Lira 1995 also states that the first hemorrhage episode occurred at a gestation age of 34 weeks.

The present study also reveals that in 51% of cases, bleeding occured before 36weeks and it correlates with the result of Hibbard 1988. The peak incidence in the present series is around 34 weeks and correlates with the report

of libra 1995. Mc shane 1975-1982, reports that the mean gestational age at onset of bleeding is 29.6 weeks. On the contrary in our series the mean gestational age at onset bleeding was 34.95 weeks.

Recurrent Rate

Recurrence rate of 1.96% for placenta previa report in our series is comparable to the 2.3% reported by cotton *et al*. 1980 and report of RSRM Hospital 1997. This contradicts the reports of Macafee's 1945 as 12% and 0.29 % of Purandare 1968.

Various Studies report the following recurrence rate :

Purandare	1968	0.29
Cotton	1980	2.3
Kelly and Iffy	1981	4-8
Gorodesk	1981	3.2
Lavery	1990	4-8
Monica	1995	2.4
RSRM Hospital	1997	1.9
Rasmussen	2000	2.3
Present Study	2006-2007	1.96

The present study correlates with the observations of Cotton et al 1980, Monica 1995, R.S.R.M. report 1997, and Rasmussen 2000.

Expectant Management

Literature states that 54% of patients who are kept on expectant management delivered with in one week. Rosario 1971 could undertake expectant line of management in only 23% of cases, on the other hand Cotton et al. 1980 have reported a much favourable outcome of expectant management in 66% of patients. In Maheshkumar 2002 study only 20% of cases were kept on conservative management and 67% of them delivered after 37 weeks.

In our present study expectant line of management was carried out in 43% of cases and it was successful in prolonging pregnancy by more than 1 week in 66% cases. Comparing with Cotton et al. 1980 and Maheshkumar 2002 report, our series also reports a similar favourable outcome.

Gestational Age at Delivery

The following is the gestational age at delivery observed by various authors.

Brenner et al	1978	< 36	60%
Crane	1999	Preterm delivery	46.56%
Maheshkumar	2002	< 37	42.5%
Fukuioka	2003	< 36	78%
Present Study	2006 – 2007	< 37	38%

In our study, 36.63% of babies were born before 37 wks, 63.37% cases after 37 wks correlated with the studies of D. Getahum, C.V. Ananth and colleagues (2006) where the incidence of delivery before 37 wks for women with and without placenta previa were 37.68% and 69% respectively.

Type of Placenta Previa

Author	I & II Degree	III & IV Degree
Simpson 1962-74	73%	27%
Macafee 1945	47%	53%
Present study 2006 – 2007	48%	52%

Our study correlates with the observation of Macafee.

Ultrasound – Accuracy

During our study 128 cases with clinical suspicion of placenta previa underwent both transabdominal and transvaginal USG. TVS detected 112 of 114 cases with the sensitivity of 98%. TAS detected 108 of 114 cases with sensitivity of 94.7%.

Mode of Delivery

Cesarean Section rate reported by various authors are as follows :

Author	Year	Percentage
Menon	1954-1961	55.12%
Rosario	1971	65%
RSRM Report	1997	65%
Bhatt	1985	65.90%
Amarnath	1990	82%
N Wadia Hospital	1986	91.66%
Present Study	2006 – 2007	91%

The study done at Institute of Obstetric and Gynaecology, Chennai (1999), shows that the cesarean section rate is 100% in placenta previa with scarred uterus and 91% in placenta previa with unscarred uterus. In our study 100% of placenta previa with scarred uterus (previous LSCS) and 92% placenta previa with unscarred uterus were delivered by cesarean. The incidence is similar when compared with the above study.

Mahesh Kumar 2002, presents that 57% of minor degree and 86% of major degree required cesarean section. In our series 92% of minor degree and 98% of major degree were delivered by cesarean section, which is higher than the rate observed by the above study.

Type of Anaesthesia

Various authors mention the following type of anaesthesia

Author	General Anaesthesia	Regional Anaesthesia
McShane 1985	75%	25%
Parekh 2000	40%	60%
Craw Ford	-	Epidural
Present Study 2006 – 2007	17.4%	82.83%

The current study shows that regional anaesthesia is the better alternative to general anaesthesia and it correlates with result of Parekh 2000[47].

Preterm

The following are the observations of various authors regarding preterm deliveries in placenta previa.

Rosario	1975	56%
Brenner	1978	40%
Amarnath	1990	25%
Crane	1999	46.56%
Present Study	2006-2007	38%

Present series is similar to the observation of Brenner 40%, Crane 46.56%

Low Birth Weight

The results of difference studies are as follows :

Hibbard	1988	73%
Khosla		66%
Zhanghna	1992	58%
Current Study	2006 – 2007	49.12%

In our series 49.12% of babies were less than 2.5 Kg.

Low Apgar score noted in our series 37.3% is comparable to that noted by Brenner et al (39%).

Maternal Mortality rate (MMR)

Literature reveals that 150 years ago MMR was 30%

The reports of various authors in cases of placenta previa are as follows

Menon	1959-61	2.7%
Puruandare		4.1%
D.Das		2.1%
Erskine Hospital, Madurai	1968-72	3.4%
SGG Hospital	1985	1%
Current Study	2006 – 2007	Nil

Perinatal Mortality

Various Authors show the following percentage

Haung 1990	60%
Mabie 1992	4.8%
Crane 1999	2-30%
Current Study 2006-2007	5.8%

SUMMARY

1. The total number of deliveries during the study period were 14246. Of these 114 cases were placenta previa.

2. The incidence of placenta previa among total deliveries during the study period was 0.8%.

3. The risk of occurrence of placenta previa is increased with advancing maternal age, gravidity, parity, short interpregnancy interval, previous abortions and previous uterine surgery.

4. No significant association was found statistically between placenta previa and multiple gestation.

5. In our study it was observed that there was no association between male babies and placenta previa.

6. The risk of breech presentation and congenital anomalies was increased with placenta previa cases.

7. Painless bleeding PV was the predominant complaint among 77% of cases.

8. The peak incidence of bleeding is noted around 34 weeks and the mean gestational age at bleeding was 34.95 weeks.

9. Recurrence rate of placenta previa is 1.96%.

10. 38% of cases delivered before 37 weeks with average gestational age at delivery is 36.91± 2.97 weeks.
11. 91% of placenta previa cases were delivered by cesarean section.
12. Regional anaesthesia (91%) was administered for 82% and General anaesthesia 18%.
13. 10% of cases developed PPH and all the cases were managed conservatively. There were 2 cesarean hysterectomy for placenta percreta.
14. The incidence of preterm delivery in placenta previa is 38%.
15. 49.12 of babies were less than 2.4 kg.
16. Minor degree was present in 48% and major degree was present in 82% of cases.

CONCLUSION

Placenta previa, whether found fortuitously by ultrasound or with the clinical emergency of maternal hemorrhage carries significant maternal and fetal risk. Accurate diagnosis, judicious expectant management with blood transfusion as required and timely delivery can lead to the most favourable outcome.

The current study suggested there is association between advancing maternal age, gravidity parity previous abortion and cesarean sections as increased risk factors for placenta previa.

Regional anaesthesia may be safely administered in cases of placenta previa. Anticipation of the clinical complications like PPH and conservative management may avoid serious consequences.

Since the incidence of preterm and low birth weight babies is high in cases of placenta previa delivery must be conducted in a tertiary care centre with good neonatal setup.

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PROFORMA

1. NAME :
2. AGE :
3. IP NO :
4. UNIT :
5. Booking status :
6. OBSTETRIC HISTORY
   - Complaints, h/o bleeding, associated with pain or not, duration of bleeding
   - NUMBER OF PREVIOUS NORMAL DELIVERIES
   - NUMBER OF PREVIOUS LSCS, INDICATION EMERGENCY/ELECTIVE, INTERVAL BETWEEN TWO DELIVERIES AND POST OPERATIVE EVENTS
   - Number of previous abortions, spontaneous or induced, certified or not certified
7. Interpregnancy interval
8. Mean gestational age of present pregnancy and the gestational age at first bleeding
9. USG findings of placental localization
10. Mode of delivery
11. Type of anaesthesia in case of LSCS

12. Operative findings in case of operative intervention

13. Birth weight of the baby, its Apgar score

CODING SHEET

A) Booking status
- B Booked
- UB Unbooked

B) Previous obstetric outcome

C) Inter pregnancy interval

D) Presenting complaints
1) 1.bleeding p/v
2) 2.abdominal pain
3) 3.draining p/v
4) 4.diminished fetal movements
5) 5.safe confinement
6) 6.others

E) TAS Findings

1) 1-.Type1
2) 2-Type2 a-anterior b posterior
3) 3.-Type3 p percreta
4) 4.-Type4

F) TVS Findings

G) Gestational age at bleeding

H) Present pregnancy outcome

I) Type of anaesthesia

J) Operative findings

K) Gestational age at delivery

L) Maturity

M) Apgar

N) Anamolies

O) Malpresentations